GENERAL SCIENCE

1959 Science Review

Hitting the moon and electronically photographing its hidden side were top achievements, as astronauts began training for space flights. New power sources explored.

This summary is limited by space to highlights, and credit to investigators and institutions is necessarily omitted. Most of the events are described in detail in the pages of SCIENCE NEWS LETTER *for the current year. If you wish to refer to any particular report, you may find it readily through the index. (See SNL, June 27, and also the issue that will appear next week, Dec. 26.) If you want more information about any item in the summary, send 25 cents to help cover answering costs for each item upon which more information is requested.*

By SCIENCE SERVICE STAFF

A GLIMPSE by rocketed instruments at the other, hidden side of the moon, discovering a new form of ancient man-like creature, attaching an image converter device to large telescopes to increase their effectiveness, synthesizing the largest protein molecule yet made, training space aeronauts—these are some of man's 1959 science and technical advances.

The competition between U. S. and U. S. S. R. technology and science continued unabated, with the Soviets ahead in space exploration due to their rocket shots around and hitting the moon, but U. S. rockets have put an increasing number of satellites into orbit, giving new information on natural radiation belts about the earth and other space conditions.

Nine new earth satellites launched by the U. S. A. were in orbit during 1959 and two U. S. space probes were successful, with Pioneer IV orbiting the sun and becoming an artificial planet. The U. S. S. R. Lunik was the first artificial planet, Lunik II hit the moon and Lunik III did a U-turn around the moon.

Seven young men went into training with the objective of being the first human beings to be transported into space and return to earth. The American astronauts are probably paralleled by similar Russian space men in training.

Before satellites containing pilots are launched, successful recaptures of capsules such as would be used must be achieved with a high degree of reliability. These tests began during the past year and will continue in 1960 and later until the apparatus and techniques are perfected.

For human-piloted flights closer to earth, the U. S. X-15 experimental rocket plane for high speeds at the top of the atmosphere made successful tests.

World travel entered the jet age on a large scale with 1958's inauguration of jet passenger service across the Atlantic being followed in 1959 by jets around the world, clipping hours off the travel times between continents.

Although scientifically less important than many less spectacular achievements, the electronic photographs of the hidden side of the moon attracted major attention. Lacking the detail that is necessary for a determination of whether the unseen side is any different significantly from the familiar side we see, the pictures nevertheless show how rocketed instruments can explore outer space. Mars and Venus are space objects on the schedules of future flights.

Radar signals were sent round trip to Venus during 1959, and the use and new construction of giant radio telescopes for observing the natural radio emanations from space, continued.

Man has discovered much of the universe without traveling or sending instruments into space, and this older form of exploration continued with increasing results. The second largest telescope in the world, the 120-inch on Mt. Hamilton, Calif., went into service, with its perception augmented by an image amplifier, an electronic device that magnifies so effectively that it allows a telescope to perform as though it were many times as large. Just as improved photographic plates in the last decade achieved increased telescopic effectiveness, so the image converter allows another step-up in reaching into astronomic space.

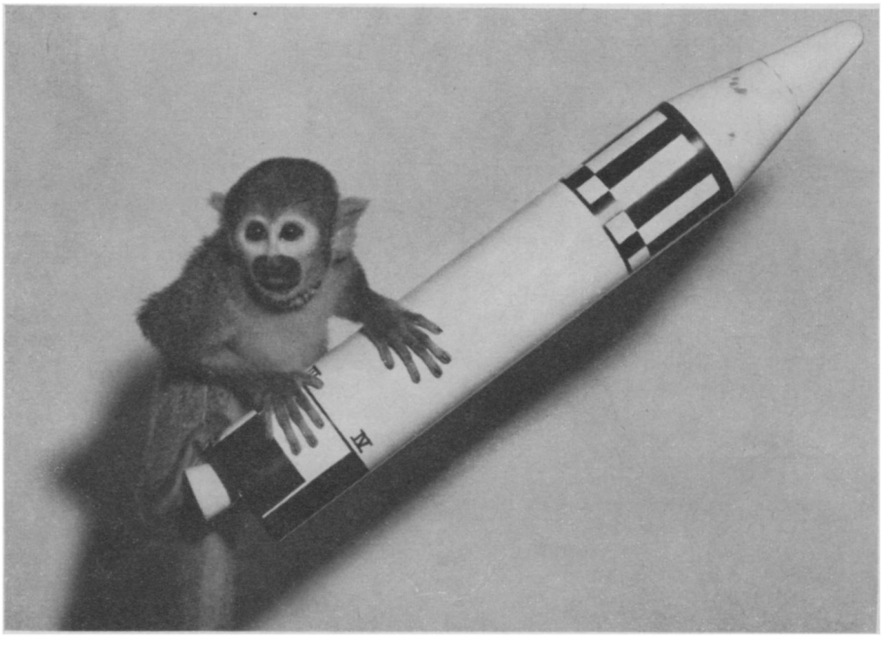
Electronics produced new devices and found added applications. The tunnel diode may ultimately replace the transistor in tiny radios and computers and maser amplifiers were found to be capable of operating at about 350 degrees below zero Fahrenheit. Light beams were magnified by using excited gas molecules in a maser-type device.

The practical control of fusion, the hydrogen-bomb reaction, for power purposes was not achieved as had been hoped, but progress was made in other methods of power production. Magnetohydrodynamics, in which an ionized gas moves in a magnetic field to make electric current, was demonstrated and a combination of large power companies entered upon practical development. Another source of electricity was developed in the form of fuel cells which were used to power a tractor, foreshadowing other automotive applications. Heat from waste atomic products was converted directly into electricity in another device.

The St. Lawrence Seaway, one of the great engineering feats of this era, was completed in 1959 and opened to ocean-going vessels. The use of hydrogen-bomb explosions for digging new harbors and other such engineering works continued to be discussed, but the prohibition of atomic explosions now in effect and being considered as a permanent international ban makes it doubtful that use will be made of atomic energy for such purposes.

The atomic power plants being built in various parts of the United States, England and Russia made progress toward completion, their future somewhat clouded by the

(Continued on page 413)



SPACE TRAVELER—One of the several monkeys in training for space flight is shown with a model of the missile used in U. S. space probes. Two monkeys were successfully recovered from a flight 300 miles into space, thus indicating the problem of re-entry has been largely solved.

PUBLIC HEALTH

Steroids Under Inquiry

STEROID HORMONES, currently the principal subjects in Senator Estes Kefauver's (D.-Tenn.) latest hearings, began trickling onto the market nine years ago.

The first was cortisone, introduced by Merck and Company, Rahway, N. J., in 1950, followed by hydrocortisone two years later. Cortisone is marketed as Cortone, Cortogen and Cortisone. Hydrocortisone is sold as Hydrocortone, Cortef and Cortril.

Steroid hormones are used for many purposes including the treatment of allergic disorders such as bronchial asthma and the reactions to other drugs; inflammatory diseases of the eye; skin diseases; blood diseases such as pernicious anemia; kidney diseases, and pulmonary fibrosis.

But their most widespread use is in the treatment of rheumatic diseases. It is estimated that roughly 10,000,000 Americans are afflicted with rheumatic disorders, about one person in every 16 of the population. More than 1,000,000 are permanently disabled. Rheumatoid disease has become known as the number one crippler, striking more people than cancer, heart disease, and tuberculosis combined.

Steroids do not cure arthritis. They do, however, relieve patients from severe pain for periods of time.

Other steroid hormones now on the market include prednisone and prednisolone, introduced in 1955 by Schering Corporation, Bloomfield, N. J. These two are sold as Meticorten & Meticortelone, Deltra & Hydeltra, and Deltasone & Delta-Cortef. Sterane is still another trade name for prednisolone.

In 1957 Upjohn Company of Kalamazoo, Mich., introduced methyl-prednisolone which they shortened to Medrol, while Squibb & Sons, New York City, and Lederle Laboratories of Pearl River, N. Y., presented triamcinolone, labelled Aristocort and Kenacort.

By 1958, Merck was back to introduce still another, dexamethasone. It is marketed under the names Decadron, Deronil and Gammacorten.

Other drug firms now engaged in manufacturing these hormones include Chas. Pfizer & Co. Inc., Brooklyn, N. Y., and Ciba Pharmaceutical Products, Inc., Summit, N. J.

In 1959, the sales from these drugs alone at the manufacturers' level are estimated at $120,000,000. Individual pills cost approximately 30 cents.

Science News Letter, December 19, 1959

ASTRONAUTICS

Monkey Is Space Hero

AMERICA'S space hero is a little cinnamon colored Rhesus monkey named Sam.

The animal had seat number one in the National Aeronautics and Space Administration's "Little Joe" shot from Wallops Island, Va., Dec. 3.

The primary purpose of the shot was to test the pilot escape mechanism, including safe recovery, in preparation for a manned space flight. The primary purpose of putting a monkey aboard was to record and compare its heartbeats in space with its heartbeats recorded under normal conditions.

Companions on the 80-mile-high trip included barley, rat nerve cells, neurospora (a common mold), cultures of bacteria and cell tissues, and flour beetle eggs. Scientists want to study what, if any, effect radiation has on these biological specimens.

This monkey had been conditioned to pull a lever during the 13-minute ride through space. Thus scientists were able to determine whether or not the animal was capable of thinking and performing physical motions during periods of weightlessness and extreme gravity forces.

The Rhesus rested on its back, from which position it was able to see a blinking red light overhead. Failure to pull the lever while the light blinked resulted in a slight electronic reminder. Cameras mounted inside the biological package were continuously taking pictures of the animal's reactions. Special equipment recorded the animal's eye movements which would, if it suffered motion sickness, snap back and forth.

When examined after recovery from the Atlantic Ocean, where the capsule landed, Sam was said to be in "fine shape." However, extensive medical tests will be made to determine more about the effects of space flight on the animal.

Science News Letter, December 19, 1959

EVOLUTION

Claim Weeping Aided Survival of Early Man

HIS TEARS may have saved early man from a lot of disease and discomfort.

In fact, it appears that weeping was extremely important in early man's development and survival, a noted anthropologist reports in *Science* (130, 1572, Dec. 4, 1959).

The long period during which a human child is dependent, when crying is his one way of communicating needs, was probably an important influence in the evolution of weeping, Dr. Ashley Montagu of Princeton, N. J., points out.

In man, "the only creature who weeps," tears have acted as a force in natural selection. Those infants and children that did cry tears, as opposed to dry crying, were better able to survive bacterial and viral attacks, Dr. Montagu says. As early as 1922, researchers have known that the enzyme lysozyme, found in nasal secretions, has important bacteria-destroying powers.

As long as the mucous membrane of the nose remains moist it is an efficient bacteria killer. However, the drying that occurs in tearless crying inactivates the mucous membrane quickly. Tears also contain the same potent enzyme, lysozyme, which has now been found effective against several virus infections.

Thus, "early in the development of man those individuals were naturally selected in the struggle for existence who were able to produce an abundant flow of tears as they cried," Dr. Montagu suggests.

The perpetuation of species was increasingly left to those who could weep.

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